

Fall 2018

BIOL 200-H01-H03: Concepts in Biology Honors

Mary Konsolaki

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BIOLOGY 200 (001 & 003): CONCEPTS IN BIOLOGY - HONORS

INSTRUCTORS: Dr. Mary Konsolaki, konsolaki@njit.edu, 340D CKB, Office Hours Wed.: 12:00-2:00 pm or by appointment


LECTURES: T, R: 10:00am-11:20am [ECEC 115]

RECITATION 1 period (80 mins), Fri. [CKB 314], please see course schedule for time and location:
(BY SECTION): <https://uisnetpr01.njit.edu/courseschedule/>

COURSE DESCRIPTION:

This course will introduce students to the study of biology at the beginning of their course of study. Central ideas in the biological sciences will be highlighted, with an emphasis on the process of scientific discovery and investigation. The course will provide the basis for more advanced coursework and learning experiences in biological sciences as students delve into the curriculum of study. This is a required course for all NJIT and Rutgers-Newark Biology majors.

REQUIRED MATERIALS:

An  **Clicker** is required for this course. You can purchase one from the NJIT or Rutgers campus bookstore. Any version of an iClicker brand device is acceptable, but we do not accept the iClicker/REEF smartphone app.

COURSE WEBSITE:

This course has no textbook. Course readings and online resources will generally be provided via Moodle: <http://moodle.njit.edu/>, login with UCID. **Please ensure you can access the Moodle site as soon as possible!**

GRADING POLICY:

Your grade for this course will be determined based on a number of components (the breakdown is below).

COMPONENT	% Range	STANDARD %	YOUR %
Learning journal	5 - 10%	7.50%	
Lecture Participation	5 - 10%	8.75%	
Recitation preparation/ participation	10 - 18%	16.25%	
Homework / Quizzes	25 - 30%	27.50%	
Projects	15 - 30%	20%	
Exams	10 - 20%	20%	
TOTAL		100%	

LETTER GRADE	SCALE
A	> 90%
B+	85 – 90%
B	80 – 85%
C+	75 – 80%
C	70 – 75%
D	60 – 70%
F	< 60%

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SCHEDULE AND COURSE OUTLINE: Dates listed by week; lectures will meet twice every week and recitation will meet every week, unless otherwise noted. Please note that this is the proposed schedule and is subject to change. A more detailed schedule will be continually updated via the course Moodle site.

WEEK OF	LECTURE TOPIC	RECITATION	SELECTED ASSIGNMENTS
9/3	Intro: Syllabus, Class purpose, Goals What is Science?	Discussion on Intelligence	HW 1 - Syllabus (5pts) Pre- Quiz
9/10	Graphing/Numbers & Figures What is Biology?	Monarch butterflies and Bt corn	Answer Part 1 questions
9/17	Evolution/Natural Selection Adaptation/Fitness	Evolution of behavior/Source of variation	HW 2 Selection assignment (10pts)
9/24	What is flu? DNA Discovery/Structure	Disease spread/Avery's experiment	Quiz 1 on Moodle Finish graph for recitation
10/1	DNA Replication Transcription/RNA processing	Copying DNA/PCR activity	HW 3 Bird flu (10 pts)
10/8	Translation Gene Expression	Decoding the flu/ DNA concept Map	Project 1, Part 1
10/15	Mutation Phylogenetic Trees	Nothing in Evolution Makes Sense Except in the Light of DNA	Project 1, Part 2
10/22	Exam 1 Scientific Writing	Discuss Exam 1	Project 1, Part 3
10/29	What is DFTD? Cell Cycle/Mitosis	Ebola wars	HW 4 Plagiarism (10pts)
11/5	Cancer Meiosis	Cancer genetics	Quiz 2 on Moodle Project 1, Part 4
11/12	Epigenetics Inheritance	Gene-edited pigs as pets/Pedigree Worksheet	HW 5 Graphing devils (10 pts) Project 2, Part 1
11/19	Population Genetics Thurs. - No Lecture (Thanksgiving)	NO Recitations	HW 6 Pedigrees (10 pts)
11/26	Interactions / Competition Predation / Trophic Cascades	A trip to the beach-Algal bloom	Project 2, Part 2
12/3	Interaction Networks Life History Strategies	Tasmanian devil life history	Project 2, Part 3 Quiz 3 on Moodle
12/10	Other examples: Ebola Thu – No Lecture	NO Recitations	HW7 – Ebola readings questions (10 pts) Project 2, Part 4
12/15-21	Exam 2 - During Final Exam Week***		http://www5.njit.edu/registrar/exams/
FINALS	FINAL EXAM WEEK: DECEMBER 15-21, 2018		

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*****DO NOT SCHEDULE TRAVEL DURING THE FINAL EXAM PERIOD UNTIL AFTER THE NJIT FINAL EXAM SCHEDULE HAS BEEN ANNOUNCED.**

ATTENDANCE, MAKE-UP, AND LATENESS POLICY:

- ☐ Lectures and recitations are linked, and attendance at all course sessions is important to doing well in the course.
- ☐ Weekly quizzes will be given in recitation, so be sure to arrive prepared for class. If you must miss recitation for a valid reason, please discuss making up the missed material with your recitation instructor as soon as possible.
- ☐ Attendance and participation in lecture will be assessed using the iClickers. Be sure you bring your iClicker to every lecture!
- ☐ Late assignments will be deducted 10% of the points available for each 24 hours after the assignment was due. This is true for ALL assignments. Exams and quizzes may be made up only with a valid, documented excuse.

ACADEMIC DISHONESTY: The course has a zero tolerance policy for academic dishonesty, including plagiarism and cheating. Instances of dishonesty will be punished by a zero on the assignment and consultation with the office of the Dean of Students to determine if further action is required. If you have any questions about what constitutes plagiarism or cheating, please ask or refer to the [Academic Integrity Code](#).

LEARNING OUTCOMES:

1. **Learning How to Learn**
 - Students will develop personal learning strategies based on recognition of their own learning processes.
 - Students will identify their learning style and develop a learning plan that is aligned with that style.
 - Students will reflect on the note taking and study process and self-monitor their habits throughout the semester
 - Students will develop a plan for their continued learning beyond this course.
2. **Application**
 - Students will develop hypotheses to explain observed phenomena.
 - Students will design a basic experiment to test a hypothesis, taking into account the ethical and methodological considerations for proper experimental design.
 - Students will read and evaluate data critically:
 - identify and describe patterns in raw data.
 - interpret statistical analysis of others' results.
 - draw conclusions based on graphical presentation of data.
 - Students will communicate scientific information effectively:
 - present source material without plagiarizing.
 - convey information in written and graphical form.
 - target delivery appropriately to audience.
3. **Integration**
 - Students will synthesize ideas from multiple areas in order develop complex concepts.
4. **Human Dimension**
 - Students will feel confident in their ability to apply knowledge to solve problems.
 - Students will cooperate with their peers to solve problems as part of a team.
 - Students will take responsibility for their learning process and academic success.

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5. Biological Principles

Students will....

1. Identify mechanisms of evolutionary change and explain how they lead to genetic change in populations through time.
2. Describe the structural characteristics of nucleotides (DNA/RNA) and explain how they are related to the functions of these molecules.
3. Identify the basic steps involved in gene expression and describe ways that gene expression can be regulated so that different cells produce different proteins.
4. Be able to transcribe information from DNA to RNA and to translate mRNA into amino acid sequences.
5. Interpret information depicted on a phylogenetic tree.
6. Outline the stages of cell division (mitosis and meiosis), explain what occurs during each stage, and describe how the nuclear DNA of daughter cells compares to that of the original cell.
7. Be able to utilize a Punnett square to predict the potential genotype/phenotype of offspring.
8. Define and give some examples of interspecific interactions and describe how different types of interactions affect the population sizes of the species involved.
9. Identify the different trophic levels in a community and explain how energy moves through them.
10. Explain traits related to an organism's life history and what influences the evolution of different life history strategies.

Individual class sessions will likely have more specific content outcomes, based on what is being discussed that week and how it relates to the larger goals of the course. Look for those to be posted to Moodle and disclosed by the professor.

Succeeding in BIOL 200 – Honors

"The scientist is not a person who gives the right answers; he's one who asks the right questions." - Claude Lévi-Strauss

"Learning is an active process, and it requires actively thinking, discussing and writing. Being successful at this process necessitates you understanding how you best learn biology. That requires thinking about more than just what you are learning, but how you are learning it. This is referred to as metacognition. Practicing this process will make you more efficient learners and better able to learn and integrate new material.

1. **Be Present.** You need to show up to class, but that means more than just being physically present in the room. Texting, sleeping, idly chatting with your neighbors, and surfing the internet all mean that you probably aren't involved in class. Engagement in class activities means that you will learn more and struggle less when you work on your own later.
2. **Be Proactive.** This applies to a number of contexts. For example, cramming for an exam is something that students love to do, and sometimes it even feels vaguely successful –especially when memorization of something for short-term recall is the goal. Memorization of facts is not the point of this course though, so that strategy is even less likely to work here. Being proactive also means that you need to think about how you are doing and make an effort to improve. In other words, don't wait until you see your final grade posted online to care about how you are doing in the course.
3. **Talk.** Talking through an idea can help with your understanding. Discussion will be the focus of this course, so we will make you discuss things with your classmates, but talking things through shouldn't end when you walk out of class. Form study groups. Meet and talk about the class.
4. **Look at the Learning Outcomes.** We have provided our overall goals for you just above this section, and will include more specific ones throughout the semester. These are posted for your benefit to help guide your studying and illustrate what we think is important.
5. **Test Yourself.** Take some time to think about the material that has been covered in class. Potentially, ask yourself (or your classmates) questions like:
 - What were the main topics from this class session? (Objectives? Questions?)
 - What do I need to know in order to understand that concept, question or problem?

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- Can I break the topic into smaller parts? What parts can I explain in a manner that makes sense to me?
 - What parts are unclear or don't make sense yet?
 - How does today's class session relate to the larger goals of the course?
- Clues to the answers to several of these questions will be found in the specific learning outcomes emphasized for each class/topic.

We want you to do well in this course. (Honest!) In fact, we want to help you develop skills in this course that will help you do well in every course you take from this point forward. So, don't treat these things as a chore you just have to do for this course. These are all suggestions that can be helpful in any class that you take.

Assessment of Learning – Components

1. **Learning Journal** – Every week, you will have an assigned prompt asking you to reflect on your own learning and progress in the course, to which you must respond via your personal forum on Moodle. Journal entries are assigned over the weekend. Only instructors can see your entries, and points are awarded (2 pts per weekly entry) for complete, thoughtful responses.
2. **Lecture participation** - Lecture participation will be assessed using iClicker questions. Each lecture will include at least a couple clicker questions. You must answer (correct or not) at least 80% of the questions to receive full credit for this component; lower response rates are scaled accordingly.
3. **Recitation preparation/participation** –Recitation quizzes are given at the beginning of each recitation to ensure students arrive to class prepared, having completed the required reading. Students also receive credit for participation in recitation discussions.
4. **Quizzes and Homework** – There will be several homework assignments throughout the semester that will provide opportunities to practice skills and apply knowledge learned in class. Over the course of the semester, there will be 3 quizzes (administered via Moodle) to assess your understanding of concepts that we have covered in class and your ability to apply that knowledge. You can also earn points for completing a Pre- and Post-Quiz.
5. **Projects** – Science often requires pulling together information from multiple sources to arrive at an end result. The course will include two projects that consist of several components that build towards a final goal.
6. **Exams** – There will be two exams that cover the application and understanding of the material covered in the course. These exams will also require you to apply the skills that we have emphasized.